

MAINTENANCE INSTRUCTION

INERTIAL AIR DISCHARGE (FILTER BLOWER AND MOTOR) HATCH ASSEMBLY

DESCRIPTION

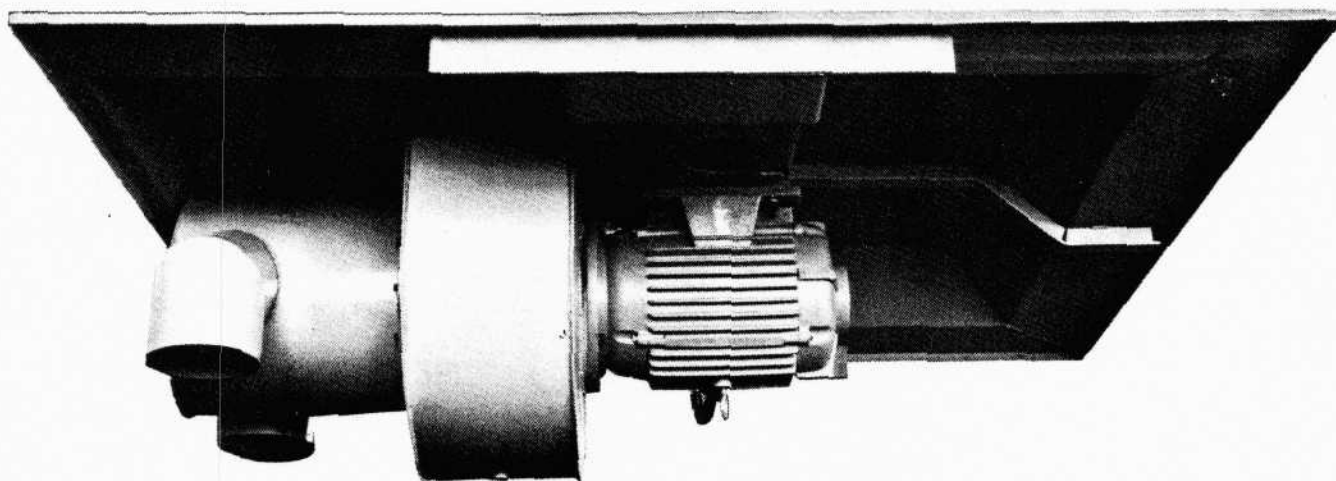
The purpose of the inertial filter blower is to remove and externally expel dirt laden air from the inertial filters. This is accomplished through the use of a 10 HP direct drive electric motor which turns the blower. Blower vane rotation exhausts the discharge through the roof of the locomotive, Fig. 1.

See Section 4 of the Locomotive Service Manual for further description of the air filtration system.

BLOWER REMOVAL

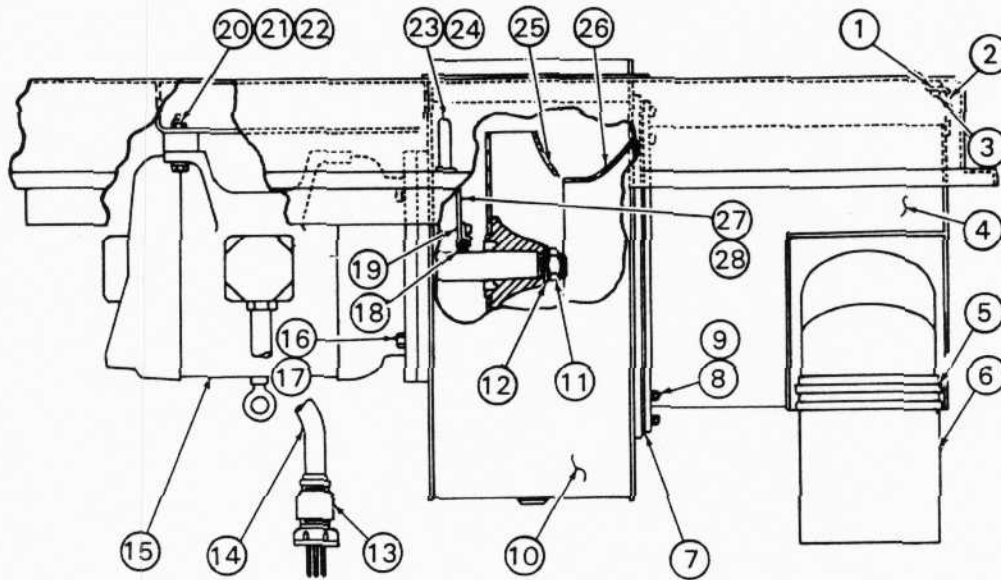
WARNING: Disconnect the electrical plug from power source to avoid any hazard potential.

1. Tape flexible conduit to motor housing to ensure against crimping during removal.
2. Disconnect any tubing and loosen the bottom two clamps (5), Fig. 2, to disconnect the flexible air ducts.



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Fig. 1 - Inertial Air Discharge Hatch Assembly



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| 1. Bracket Mounting Tapping Pad | 15. Air Discharge Motor Assembly |
| 2. Plenum Mounting Bracket | 16. 1/2" x 1-1/2" Hex Head Motor Mounting Bolt |
| 3. 3/8"-16 x 5/8" Hex. Head Bolt And 3/8" Lockwasher | 17. 1/2" Lockwasher |
| 4. Blower Plenum Assembly | 18. Felt Seal |
| 5. Hose Clamp(s) | 19. 1/4"-20 x 1/2" Hex Head Tapping Retainer Screw |
| 6. Air Duct Flexible Hose | 20. Motor Mounting Bolt |
| 7. Gasket | 21. Plain Washer |
| 8. 3/8"-16 x 1" Hex. Head Plenum Mounting Bolt | 22. Locknut |
| 9. 3/8" Lockwasher | 23. Hatch Lifting Bolt |
| 10. Motor And Blower Wheel Housing Assembly | 24. 5/8"-11 Hex. Locknut |
| 11. 1"-8 Hex. Blower Wheel Locknut | 25. Blower Wheel |
| 12. Wheel Retainer Washer | 26. Air Intake Ring |
| 13. 3 Pole Male Plug | 27. Dust Seal Closure Plate |
| 14. Flexible Conduit | 28. Closure Plate Gasket |

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Fig. 2 - Air Discharge Hatch Assembly Cutaway

3. Externally remove bolts from perimeter of hatch assembly.

4. Secure hoist clamps to the three eye bolts provided on hatch, and lift inertial air discharge hatch assembly straight up until adequate clearance is achieved.

NOTE: It may be necessary to remove welded strips surrounding blower grid prior to hatch removal.

5. Invert the hatch assembly, Fig. 3, and place on an appropriate stand.

6. Install support wedges under plenum to relieve bolt stress when disassembling.

7. Remove the 3/8"-16 x 5/8" hex head bolt and lockwasher (8) and (17), Fig. 4, from plenum mounting bracket (18).

8. Disconnect the plenum assembly (3) from the blower housing assembly (2) by removing the 3/8" lockwashers and bolts (17) and (16).

9. Remove the 1/4" bolts and washers (13), (14), and (15) at three places, Fig. 4, View B-B, securing the gasket and intake ring (6) and (5) to the blower housing (2).

NOTE: To gain access to the wheel assembly (4), Fig. 4, View A-A, it is necessary to remove the intake ring (5) by breaking the tack welds.

10. Remove the 1"-8 self-locking nut (10), Fig. 4, View A-A, and plain washer (9) from the shaft extension.

11. Pull off wheel and hub assembly.

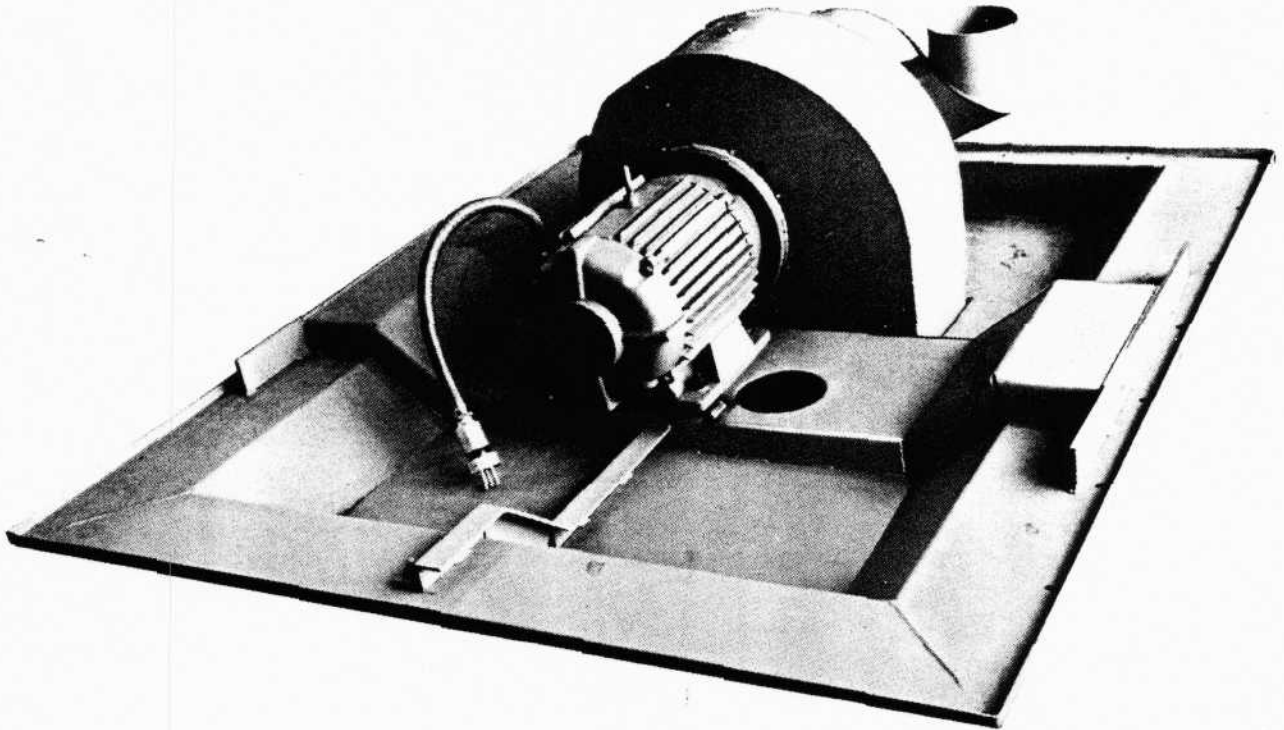


Fig. 3 - Inverted Hatch Assembly

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12. Inspect blades for chips, cracks, or looseness, and observe general condition of wheel assembly. Repair or replace components as required.
13. Remove the 1/4"-20 screws (24), Fig. 4, View C-C, securing retainer (20) and felt seal (21) to closure plate (19).
14. Remove the 5/16"-18 screws (23) securing the gasket (22) and closure plate (19) to the blower housing assembly (2).
15. Remove the 1/2"-13 hex head bolts (11), Fig. 4, and 1/2" lockwashers (12), securing the motor front end frame assembly to the blower housing assembly.
16. Remove blower housing assembly.

AIR DISCHARGE MOTOR DISASSEMBLY

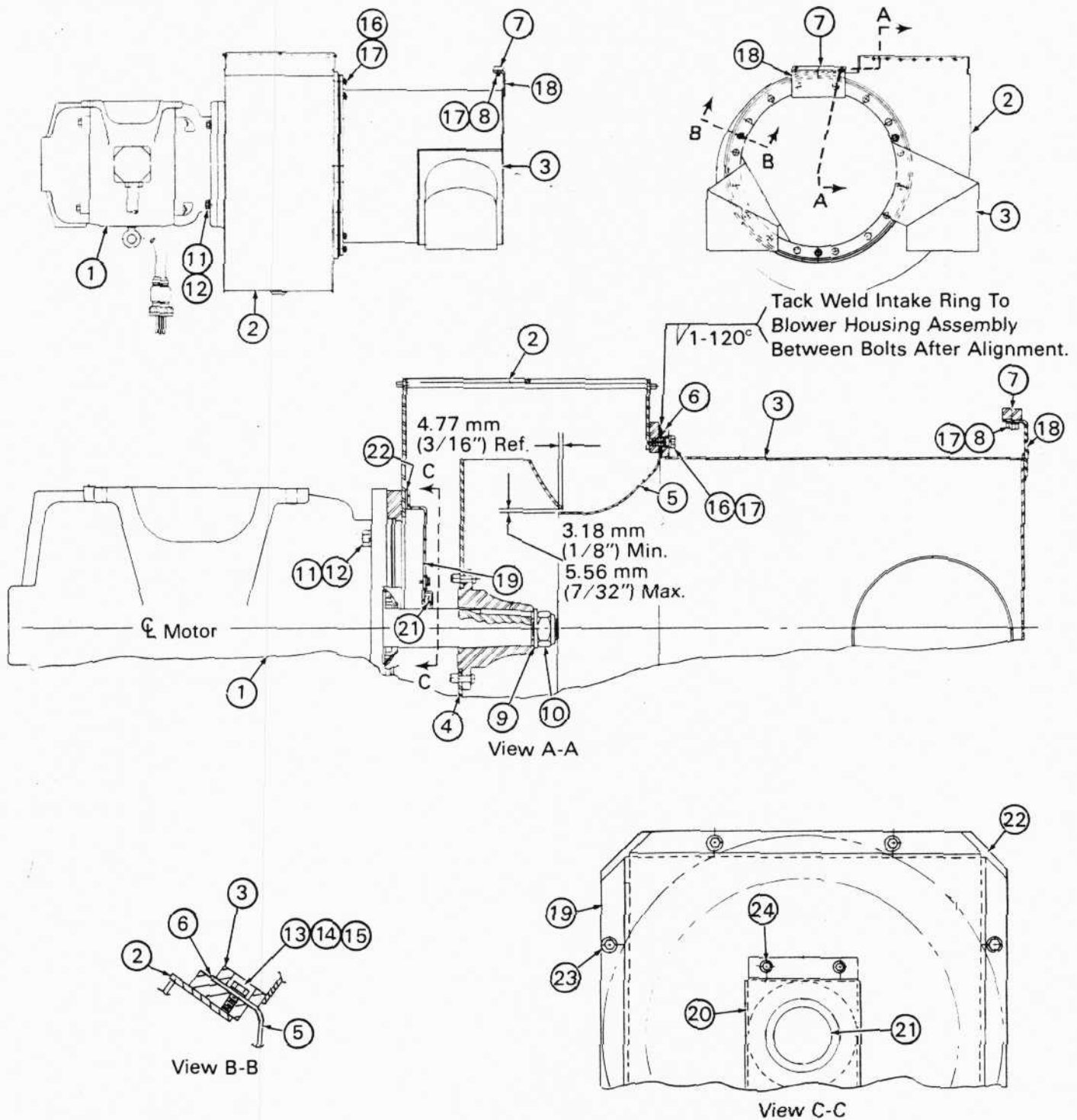
1. Remove key (1) from shaft extension taper, Fig. 5.
2. Remove four 5/16"-18 x 1-3/4" hex socket head cap screws (3) and (14) that secure each

of two bearing housings to their respective end frames.

3. Remove the four 3/8"-16 x 1-1/2" hex socket head bolts (7) securing the shaft end frame (20) to the stator (19).
4. Remove the four 3/8"-16 x 1-1/2" hex head bolts (9) and 3/8" lockwashers (10) from the rear end frame (15).
5. Remove both end frames and rubber slinger (5).
6. Remove end frames and rotor assembly (including bearings and bearing housings) from stator.

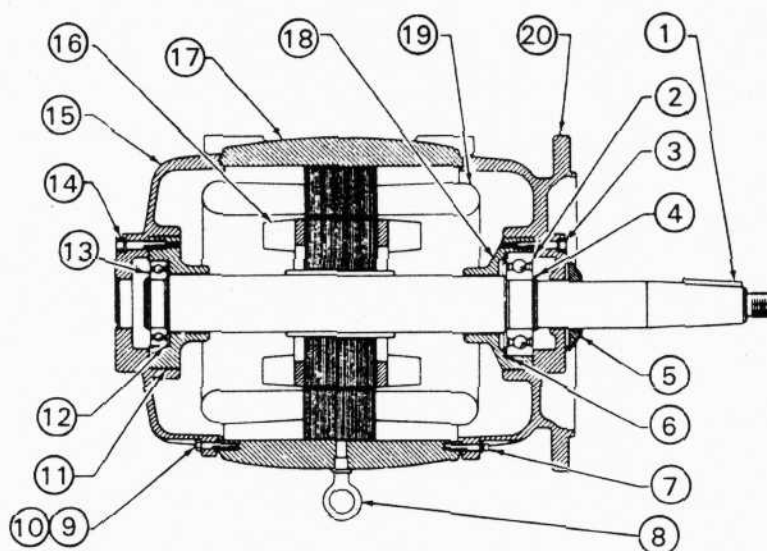
NOTE: Bearing housings (18) and (11) are positioned over bearings. These housings can be pushed back for bearing removal.

7. Remove bearing retainer ring (4) and bearing from the shaft.
8. Remove bearing housings from shaft and spring washers (6) and (12) from the housings.
9. Remove flexible conduit assembly.



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| 1. Motor | 13. 1/4"-20 Hex. Hd. Bolt |
| 2. Blower Housing Assembly | 14. 1/4" Plain Washer |
| 3. Plenum Assembly | 15. 1/4" Lockwasher |
| 4. Wheel Assembly | 16. 3/8"-16 Hex. Hd. Bolt |
| 5. Intake Ring | 17. 3/8" Lockwasher |
| 6. Gasket | 18. Bracket |
| 7. Tapping Pad | 19. Closure Plate |
| 8. 3/8"-16 Hex. Hd. Bolt | 20. Retainer |
| 9. Plain Washer | 21. Seal |
| 10. 1"-8 Self Locking Nut | 22. Gasket |
| 11. 1/2"-13 Hex. Hd. Bolt | 23. 5/16"-18 Screw |
| 12. 1/2" Lockwasher | 24. 1/4"-20 Screw |

Fig. 4 - Motor And Blower Housing Assembly



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|---|--|
| 1. Shaft Extension Key | 10. 3/8" Lockwasher |
| 2. Front Ball Bearing | 11. Rear Bearing Housing |
| 3. 5/16"-18 x 1-3/4" Hex Socket Head Bearing Housing Cap Screw | 12. Spring Washer |
| 4. Bearing Retainer Ring | 13. Rear Ball Bearing |
| 5. Rubber Slinger | 14. 5/16"-18 x 1-3/4" Hex Socket Head Bearing Housing Cap Screw |
| 6. Spring Washer | 15. Rear End Frame |
| 7. 3/8"-16 x 1-1/2" Hex Socket Head End Frame Mounting Bolt | 16. Rotor Assembly |
| 8. Lifting Eye Bolt | 17. Frame Assembly |
| 9. 3/8"-16 x 1-1/2" Hex Socket Head Bolt | 18. Front Bearing Housing |
| | 19. Stator Assembly |
| | 20. Front End Frame |

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Fig. 5 - Air Discharge Motor

INSPECTION AND TESTING

MECHANICAL

Clean all parts and remove all grease from end frames, bearing housings, and other bearing parts before inspection.

ROTOR AND SHAFT ASSEMBLY

1. Check exposed rotor shaft surfaces for wear, abrasion, or other damage. Ensure both bearing seat diameters are acceptable within the following tolerances: 50.002 mm (1.9686") min., and 50.015 mm (1.9691") max.
2. Check O.D. of rotor. A slightly rubbed O.D. is acceptable, however, ensure minimum worn diameter is not less than 182.88 mm (7.200").
3. Rotor should be dynamically balanced within .0035 N·m (1/2 in.-oz.)

BEARING HOUSINGS

1. Check bearing bore of rear end bearing housing. Bore diameter should not exceed 90.02 mm (3.544").

2. Shaft end bearing housing bore should not exceed 110.018 mm (4.3314").

Visually inspect all parts for damage; repair or replace as necessary.

ELECTRICAL

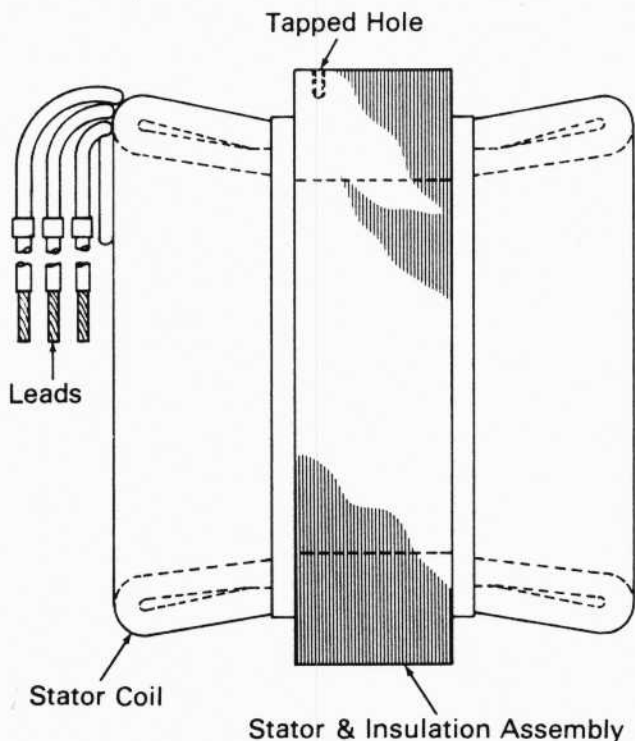
1. Inspect stator windings and leads. If winding appears satisfactory, check insulation to ground with a 500 volt megohmmeter. The minimum reading allowed is 1 megohm (when dry). If a megohmmeter reading of 1 megohm cannot be obtained, stator should be replaced.
2. Stators which have passed the insulation check should be given a phase-to-phase resistance check. Any variation from the value given in Service Data will require stator replacement.

NOTE: Satisfactory stators do not require a varnish treatment. However, stators requiring rewind should be replaced with a new stator assembly. (See Service Data.) No attempt should be made to strip and rewind defective stators.

3. Check leads for damage. Damaged leads may be replaced provided a splice can be made at the windings. No attempt should be made to open the encapsulation around the windings to get to lead connections.

REASSEMBLY

1. Reassemble the stator and coil with leads adjacent to and on same end as 1/4"-20 tapped hole, Fig. 6.
2. Tie leads and connections together with 1.58 mm (.062") diameter glass cord. (See Service Data.)



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Fig. 6 - Stator And Coil Assembly

BEARINGS AND MOTOR

1. Fill cavity in end frame (15) Fig. 5, with Chevron SRI-2 grease. Fill the lower half of cavity in end frame (20) and bearing housings (11) and (18) with Chevron SRI-2 grease (or equivalent).
2. Place bearing housings and spring washers over shaft before pressing on new bearings. Use only bearings given in Service Data when reassembling.
3. Ensure bearing contact surfaces on shaft have been thoroughly degreased using appropriate cleaner or other non-oil based solvent.

4. Apply five drops of Loctite 601 to bearing shoulder or shaft, and spread evenly around bearing seat.
 5. Press bearings (press against inner race) on to rotor shaft until they are seated against shoulder on shaft, or heat bearings to 93° C (200° F) maximum and assemble on shaft. Ensure that large bearing at shaft extension end is applied with seal side facing outboard toward shaft extension. Replace bearing retainer snap rings on shaft.
 6. Slide bearing housings over bearings and screw guide studs into housings. (See Service Data.)
 7. Insert rotor into stator, assemble end housings over bearing housings, and bolt the end housings to the stator frame.
 8. Bolt bearing housings to the end frames. Remove guide studs from bearing housing after applying at least one cap screw.
 9. Check rotor for free rotation. Rotation to be in a counter-clockwise direction when viewed from drive end.
 10. After assembly, install external rubber slinger with large diameter against end frame and replace key in shaft.
- NOTE: Place a small quantity of bearing grease on end frame where slinger contacts frame.
11. Apply sleeving over internal portion of leads at section where leads contact sharp edge of stator.
 12. Assemble conduit and plug to motor.

FINAL TEST AND INSPECTION

Apply high potential test as indicated in Service Data. Also, make a running test using 84V, 60 Hz to check rotation and bearing condition. The watts may not exceed 600 and the current may not exceed 9.8 amperes.

Run for at least 2 hours, or until there is a definite indication that the bearing temperatures are leveling off. Maximum allowable temperature rise limit is 33° C (59° F). Ensure direction of rotation at shaft end is counter-clockwise, driven by phase sequence Red (1) - White (2) - Black (3).

Reinstall shaft key.

BLOWER INSTALLATION

1. Reinstall blower housing assembly.
2. Reinstall the 1/2"-13 hex head bolts (11), Fig. 4, and 1/2" lockwashers (12), securing the motor front end frame assembly to the blower housing assembly.
3. Reinstall gasket (22), Fig. 4, View C-C, and closure plate (19) to the blower housing assembly (2) using the 5/16"-18 screws (23).
4. Saturate felt seal (21) with light bearing oil, and reinstall felt seal (21) and retainer (20) to closure plate (19) using the 1/4"-20 screws.
5. Remove key, Fig. 4, View A-A, prior to installing wheel assembly. Match wheel over keyway on shaft and reinstall the key.

NOTE: Wheel disc surface must be square with axis of hub within 1.59 mm (1/16") T.I.R. at O.D. Balance weights should be welded to disc as required. However, weight thickness should not exceed 3.18 mm (1/8") thickness. Finished static balance to be within 720 mg.m (1 in.-oz.)

6. Reinstall the plain washer (9) and 1"-8 self-locking nut (10) on shaft extension. Tighten securely.

NOTE: As an aid in tightening, it is desirable to insert a "drift pin" through wheel blades to ensure against movement.

7. Reinstall the gasket and intake ring (6) and (5) to the blower housing (2), Fig. 4, View B-B, using 1/4" bolts and washers (13), (14), and (15).

NOTE: Ensure wheel/ring alignment tolerances are within the dimensions given in Fig. 4, View A-A. Tack weld intake ring to housing between bolts at three places after alignment.

8. Reassemble the plenum assembly (3), Fig. 4, to the blower housing assembly (2) using the 3/8" lockwashers and bolts (17) and (16).
9. Reinstall the plenum mounting bracket (18) using the 3/8"-16 x 5/8" hex head bolts and lockwashers (8) and (17).
10. Ensure previously installed support wedges are removed from assembly prior to replacement of inertial air discharge hatch assembly into locomotive.
11. Using the hoist, right inertial discharge hatch assembly and reinstall in locomotive.
12. Replace hatch assembly bolts, and reweld strips around blower grid if necessary.
13. Reconnect the flexible air intake ducts, clamps, and tubing.
14. Connect plug to power source.

SERVICE DATA

MOTOR 3087168

(10 HP, 200 VDC, 120 Hz @ 3600 RPM)

Permissible shaft runout 0.08 mm (.003") indicator reading
 Max. face runout 0.18 mm (.007") indicator reading
 Permissible eccentricity of mounting rabbet 0.18 mm (.007") indicator reading
 Vibration amplitude not to exceed 0.038 mm (.0015")

STATOR 5540018

Phase-To-Phase Resistance1082 Ohms ± 5% @ 75° C (167° F)

ROTOR

Dynamically balanced within .0035 N·m (1/2 in.-oz.)

M.I. 3614

BEARINGS

Shaft end 9415088
Rear end 907889

EQUIPMENT AND MATERIALS

Grease, 8 lbs. Chevron SRI-2 8490018
Cleaner-Activator 8352873
Loctite 601 9087621
Cord, Glass - 1.58 mm (.062") 8133186

HI-POT

1200 Volts-To-Ground for 10 seconds

REFERENCE

Scheduled Maintenance Program Blower-Type GP
And SD Model Locomotives (645 Engines) M.I. 1738

Scheduled Maintenance Program Turbocharged F, GP,
And SD Model Locomotives (645 Engines) M.I. 1740

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